

REMARKS

Applicant hereby responds to the Office Action of May 7, 2007, in the above-referenced patent application. Applicant wishes to thank the Examiner for carefully considering the application, for allowing claims 15, 16, 18 and 20, and for indicating that claims 3 and 23 contain allowable subject matter.

Disposition of Claims

Claims 1, 3-21 and 23-40 are currently pending. Claims 1, 15, 18, 20, 21, 35, 38, and 40 are independent.

Claims 35, 36, 38 and 40 were rejected under 35 U.S.C. 112, second paragraph, for lacking antecedent basis. Claims 1, 4, 21 and 24 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,327,257 ("Hrytzak") in view of U.S. Patent Application Pub. No. 20020067862 ("Kim"). Claims 5-14, 17, 19, 25-34, 37 and 39 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hrytzak in view of Kim, and further in view of U.S. Patent 5,959,693 ("Wu"). Claims 3 and 23 were deemed allowable if rewritten in independent form, including all the limitations of their base claims and any intervening claims. As discussed below, the base claims 1 and 21 are believed allowable, thus, rewriting claims 3 and 23 in independent form is deferred at this time.

Rejections under 35 U.S.C. § 112

Claims 35, 36, 38 and 40 were rejected under 35 U.S.C. 112, second paragraph, for lacking antecedent basis. Claims 35, 38 and 40 have been amended to correct antecedent basis as suggested by the Examiner. Accordingly, withdrawal of the rejection is respectfully requested.

Unrelated to the above rejections under 35 U.S.C. 112, Claims 1 and 21 have been amended to correct minor informalities.

No new matter has been added by way of these amendments and none of the amendments is made in view of prior art.

Rejections under 35 U.S.C. § 103

Claims 1, 4, 21 and 24

Claims 1, 4, 21 and 24 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,327,257 (“Hrytzak”) in view of U.S. Patent Application Pub. No. 20020067862 (“Kim”). The rejection is respectfully traversed because for at least the following reasons, Hrytzak and Kim, alone or combined, do not show or suggest the claimed invention.

The claimed invention is directed to image interpolation. Independent claims 1 and 21 each require, in part, “calculating a different weighting coefficient for the output of each filter by *estimating* the image high frequency level at the interpolated selected

image position, and calculating the weighting coefficients based on the *estimated* image high frequency level.” Hrytzak and Kim, even if combined, fail to show or suggest at least these claimed limitations.

The instant Office Action agrees that Hrytzak fails to teach such claimed limitations, but relies upon Kim to supply such limitations, particularly the “*estimated* image high frequency level ‘ $a \cdot h(m,n)$ ’.” Applicant respectfully disagrees. Referring to, *e.g.*, paragraphs [0025] and [0027] of Kim, the high-pass filtered image $h(m,n)$ is the *exact* output of the high-pass filter, not the “estimated” high frequency level as claimed. This is evident from eq. (1) of Kim, where it is clearly shown that the processed pixel value $g(m,n)$ corresponds to the *exact* input pixel position (m,n) . This is not surprising because Kim is directed to enhancing details of an image, and has nothing to do with “interpolating” image positions as claimed, and thus cannot have possibly provided a way of “estimating” the high frequency level at the “interpolated” image position as claimed.

Applicant further respectfully submits that there is no reason, motivation or suggestion to combine Hrytzak with Kim. As discussed above, Kim is aimed at enhancing a digital image while suppressing undershoots and overshoots, and is completely silent with respect to image interpolation. This is further evident in paragraph [0025] of Kim, where it is clearly shown that the processed image is an $M \times N$ matrix exactly corresponding to the input $M \times N$ image matrix. As there is no “interpolation” involved in Kim, there is no need in Kim to “estimate” a high frequency level. Rather, the high pass filtered pixel values in Kim are *exactly* calculated for existing image

positions. Thus, Kim cannot have possibly supplied a motivation to modify Hrytzak to supply “estimating” a high frequency level as claimed.

In view of the above, Hrytzak and Kim, whether considered separately or in combination, fail to show or suggest the claimed invention as recited in independent claims 1 and 21 of the present application. In addition, there is no reason, motivation or suggestion to combine Hrytzak and Kim. Thus, independent claims 1 and 21 of the present application are patentable over Hrytzak and Kim for at least the reasons set forth above. Dependent claims 4 and 24 are allowable for at least the same reasons. Accordingly, withdrawal of the rejection is respectfully requested.

Claims 5-14, 17, 19, 25-34, 37 and 39

Claims 5-14, 17, 19, 25-34, 37 and 39 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hrytzak in view of Kim, and further in view of U.S. Patent 5,959,693 (“Wu”). The rejection is respectfully traversed because for at least the following reasons, Hrytzak, Kim and Wu, alone or combined, do not show or suggest the claimed invention.

As discussed above, Hrytzak and Kim, alone or in combination, fail to show or suggest at least the claimed “calculating a different weighting coefficient for the output of each filter by *estimating* the image high frequency level at the interpolated selected image position, and calculating the weighting coefficients based on the *estimated image high frequency level*,” which are also limitations for dependent claims 5-14, 17, 19, 25-34, 37

and 39. Wu, like Hrytzak and Kim discussed above, also fails to show or suggest at least the above-mentioned limitations, or to supply that which Hrytzak and Kim lack. More specifically, all the filters employed by Wu are *low-pass* filters (*see, e.g.*, col. 2, lines 55-57 of Wu) for averaging the pixel amplitude in order to reduce noise. The low-pass filters filter out the high-frequency components, opposite to the “high frequency level” as required by the claimed invention.

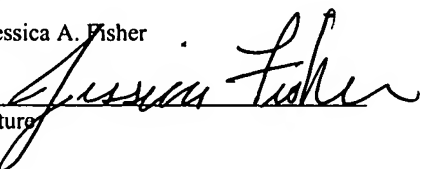
It is further respectfully submitted that there is no reason, motivation or suggestion to combine the cited references. As discussed above, there is no motivation to combine Hrytzak and Kim. Further, Wu teaches using *low-pass* filters for noise reduction. A high-pass filter as taught by Kim cannot possibly be employed by Wu, otherwise the noise will become unbearable because the high-pass filter does not filter out the noise, and that is why Wu specifically requires that low-pass filters be used. Thus, Wu teaches away from the combination. Thus, there is no motivation to combine Hrytzak, Kim and Wu.

In view of the above, Hrytzak, Kim and Wu, whether considered separately or in any combination, fail to show or suggest the claimed invention as recited in claims 5-14, 17, 19, 25-34, 37 and 39 of the present application. In addition, there is no reason, motivation or suggestion to combine Hrytzak, Kim and Wu; and Wu teaches away from the combination of the cited references. Thus, claims 5-14, 17, 19, 25-34, 37 and 39 of the present application are patentable over Hrytzak, Kim and Wu for at least the reasons set forth above. Accordingly, withdrawal of the rejection is respectfully requested.

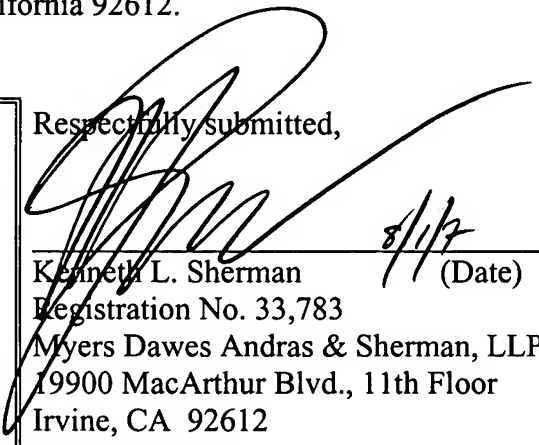
CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully requests that the rejections of the claims be withdrawn, and that the case be passed to issue. If the Examiner feels that a telephone interview would be helpful to the further prosecution of this case, Applicants respectfully request that the undersigned attorney be contacted at the listed telephone number.

Please direct all correspondence to **Myers, Dawes Andras & Sherman, LLP**,
19900 MacArthur Blvd., 11th Floor, Irvine, California 92612.

<p align="center"><u>Certificate of Mailing</u></p> <p>I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on: August <u>1</u>, 2007.</p> <p>By: Jessica A. Fisher</p> <p> Signature</p>

Respectfully submitted,


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